4. Deborah

Program Name: Deborah.java   **Input File: deborah.dat**

Deborah is quite neat in real life, but her computer desktop is a mess! It's cluttered with school assignments, personal photos, and a surprising number of cat videos. After cleanup, Deborah's files are in a nice file tree. A file tree consists of folders and files. Folders can contain files or other folders. To avoid confusion, all of Deborah's files and folders have distinct names.

Deborah has some files or folders that she uses often. These are marked as favorites. Deborah accesses her favorites often. The depth of a file or folder is the number of folders that directly or indirectly contain it. Files and folders on the desktop have a depth of 0.

For example, say Deborah has two folders on her desktop: `catvideos/` and `english/`. These each have a depth of 0. The files and folders inside these folders, like `hamlet.txt` and `tim.mov` each with a depth of 1.

Given a list of Deborah's file tree, with her favorite files and folders marked, what is the largest depth of any favorite file or folder? If multiple favorite files or folders have the same depth, output the one that comes first lexicographically.

Input: The first line of input will contain T, the number of test cases. Each test case starts with N (N <= 50), the number of files and folders on her desktop, followed by N pairs of lines. In the next N sets of data for each test case, each pair of lines describes each file or folder. The first line has the name of the file/folder, if it is a favorite or not (as an integer, 1 means favorite, 0 means not favorite), and the number of items in this file or folder. The number will always be 0 for files. The second line of each pair will have a space separated list of the names of files or folders in the folder. For files, it will be a blank line.

All names will consist only of lowercase English letters and periods and will have length at most 20. No folder will contain itself directly or indirectly. A file or folder will be contained in at most one other folder.

Output: For each test case, output a single line with the name of the favorite file or folder at the greatest depth, as well as that depth value, inside parentheses, formatted as shown below. If there are multiple files or folders as favorites sharing the same depth, output the one that comes first lexicographically.

Sample input:
```
2
5
catvideos 1 2
scarf.mov tim.mov
scarf.mov 1 0

tim.mov 0 0

hamlet.txt 1 0

english 0 1
hamlet.txt
5
d 1 1
e
b 1 1
c
c 0 1
d
a 0 1
b
e 0 0
```

Diagram of first data set (favorites in bold)

```
   catvideos            english
   /       \              /
scarf.mov  tim.mov   hamlet.txt
```

Sample output:
```
hamlet.txt (1)
d (3)
```